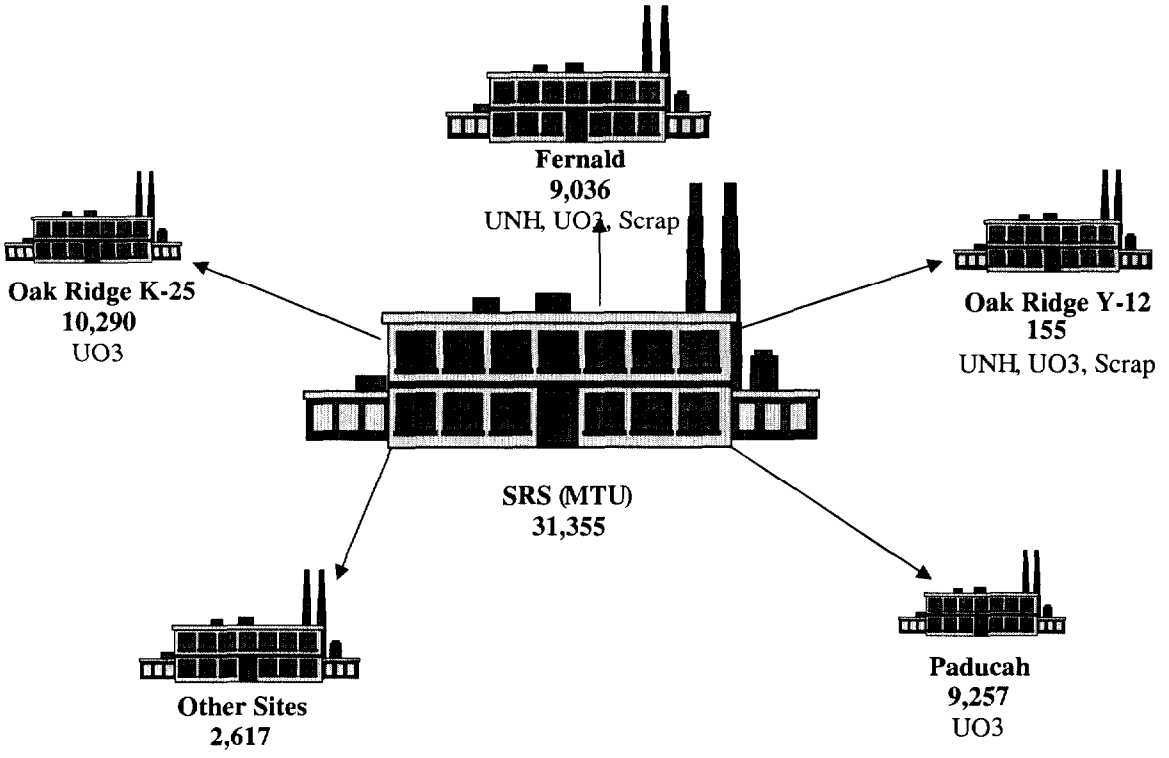
FIGURE 1-2
SRS URANIUM SHIPMENTS (MTUs)



1.0 Savannah River Site Recycle Uranium Mass Balance Project

1.1 Project Overview

Workers at Department of Energy (DOE) gaseous diffusion plants have raised a number of environment, health, and safety concerns around the operations of those facilities. Imminent hazard site reviews at DOE's three gaseous diffusion plants—Paducah, Portsmouth, and K-25/East Tennessee Technology Park (ETTP) in Oak Ridge, found no issues warranting the shut down of current operations. However, significant "legacy" issues remain concerning past practices' impact upon the environment, public/worker health and safety and the clean up of those sites. Of primary concern is the impact of transuranic and fission product constituents (plutonium, neptunium, and technetium) present in the recycled uranium streams on the health and safety of the workers at the gaseous diffusion plants and source plants like Hanford and Savannah River. The Office of Environment, Safety and Health (EH) in the DOE, has initiated five projects to investigate legacy issues associated with DOE's gaseous diffusion and other linked plants. These five projects are: (1) Office of Oversight (EH-2) inspection at the three gaseous diffusion plants to document current and past practices; (2) Office of Nuclear Safety (EH-3) conduct of a mass balance project to review the characteristics and flow of uranium throughout the Department; (3) Office of Worker Health and Safety (EH-5) conduct of an exposure assessment project to establish worker radiation exposure profiles at the Paducah, Portsmouth, and ETTP sites; (4) Office of Health Studies (EH-6) expanded medical surveillance program for gaseous diffusion plant workers and support

for compensation legislation; and (5) EH Policy Integration project to effectively communicate the EH gaseous diffusion plant projects to key stakeholders and across the DOE organization [2].

This report addresses activities at the Savannah River Site conducted in support of the Recycled Uranium Mass Balance Project (item 2 above).

1.2 Purpose and Scope

The purpose of this report is to quantitatively estimate the flow and characteristics of recycled uranium received, handled, and shipped from the Savannah River Site. This quantitative information will enable an assessment of the potential for worker exposure to radioactivity in the uranium stream, including that from technetium-99, neptunium-237, and plutonium.

This report includes all recycled uranium processed at SRS since site startup, covering the period from the early days of production to March 31, 1999.

1.3 Project Implementation Strategy

The recycle uranium mass balance project at the SRS was conducted by an inter-disciplinary site team composed of contractor and DOE-SR personnel, including personnel knowledgeable in nuclear material control and accountability, radiological health protection, process operations, analytical methods, records management, and environmental management. The team's focus was on identifying recycle uranium flows into and out of the site, the contaminant constituents present in the material shipped and received, and the impact of those contaminants on worker safety/health and the environment.

Research of historical records formed the basis for the team's conduct of this project. Project results were validated through comparison of those records with known site operating history, and with records from receiving/shipping sites throughout the complex.

2.0 Site Historical Overview

2.1 Site Description

The Savannah River Site encompasses approximately 310 square miles including portions of Aiken, Barnwell, and Allendale Counties in South Carolina. The site is situated adjacent to the Savannah River approximately 12 miles south of Aiken, South Carolina. It consists of sixteen (16) distinct areas of operation as depicted in Figure 1-3. The site was established, by the U. S. Atomic Energy Commission (AEC) in 1950, to produce plutonium and tritium for national defense and additional special nuclear materials for other government uses and for civilian purposes.

On July 25, 1950 President Harry S. Truman sent a letter to E. I. DuPont De Nemours Company President, Crawford Greenewalt requesting that DuPont undertake a new project for the Atomic Energy Commission. In response to the Truman letter and a directive to the AEC, the DuPont Company and the Atomic Energy Commission negotiated a contract whereby DuPont would design, construct, and operate what was to become the Savannah River Plant (SRP).